

USE AND ABUSE OF ANTIHYPERTENSIVE DRUGS IN THE AGED*

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THE prevalence of hypertension rises with age, as was well demonstrated in the National Health Survey,¹ which showed that approximately 30% of the population between ages 60 and 65 and 40% over age 65 have hypertensive levels of blood pressure. By comparison, 11% of individuals between ages 35 and 45 exhibit such levels of blood pressure.

Hypertension is a major cause of death among the aged and probably is the most important source of invalidism because of the damage produced in such vital organs as the brain, heart and kidneys. Hypertension aggravates and accelerates atherosclerosis and, therefore, is a leading risk factor for heart attacks and thrombotic strokes. More than half the patients developing heart attacks have borderline or definite hypertension. Even more impressive is the association with strokes where three fourths of all patients have elevated blood pressures. Hypertension also causes other major complications, including heart and renal failure.

More and more Americans are reaching their 80s. Since 1970, according to the Census Bureau, the 80 to 84 age group has grown by 19.2% and the 85 and over group by a spectacular 40% compared to an overall population growth of 5.3%. As Dr. Robert N. Butler, director of the National Institutes of Health's Institute on Aging, said, "If we all live long enough, everyone who practices medicine is going to be a geriatrician." He explained that if current predictions become a reality and one out of every five people is older than 65 by 2030, as much as 75% of physician time will be spent with older people. Further, he added that "Problems of the old account for about 40% of all hospital bed usage, 25% of all drugs used, 54 cents out of every federal health dollar, a \$10

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billion a year nursing home bill." Dr. Butler, therefore, considers aging a major issue that demands heavy investment in research, teaching, and provision of services.²

Hypertension among the elderly can be divided into diastolic and systolic types. Mild diastolic hypertension includes the diastolic range of 90 to 104 mm. Hg inclusive, regardless of the level of systolic blood pressure. Systolic hypertension can be defined as a systolic blood pressure of 160 mm. Hg or higher with a diastolic level below 90 mm. Hg. The Framingham study indicates that both of these conditions are associated with significant increases in morbidity and mortality.³ This does not mean, however, that either of these conditions will be benefitted by treatment, particularly for the elderly.

Opinion is divided on the effectiveness of treating systolic hypertension. Some physicians believe that treating "pure" systolic hypertension will not prevent complications. They further believe that lowering the blood pressure of elderly patients with mild hypertension actually may be deleterious because these patients already have blood vessels compromised by atherosclerotic changes.^{4,5} Another school of thought, however, holds that inasmuch as the incidence of hypertensive heart disease, stroke, congestive heart failure, angina, renal dysfunction, and myocardial infarction rises incrementally with elevated systolic blood pressure regardless of the diastolic level, these patients should be treated and their blood pressure brought down gradually to normal.⁶

With respect to diastolic hypertension, the Veterans Administration Cooperative Study has shown that the incidence of morbid events and death can be dramatically reduced by treating patients with diastolic blood pressures of 115 through 129 mm. Hg.⁷ The Veterans Administration Cooperative Studies Group also demonstrated that a highly significant although somewhat less marked preventive effect could be achieved by treating patients whose initial diastolic blood pressures are 105 through 114 mm. Hg regardless of age.⁸ A beneficial effect was also demonstrated for a subgroup of patients with diastolic blood pressures of 90 through 104 mm. Hg, but the decrease in morbid events did not reach statistical significance.^{8,9}

The Veterans Administration Study included 81 patients who were 60 and older. For this group of elderly patients, treatment was effective in that morbidity and mortality rates were reduced 54% in the treated as compared to the control group. However, this included patients with

moderate hypertension (105 to 114 mm. Hg) as well as mild hypertension.⁹ For patients only in the mild range (90 to 104 mm. Hg diastolic), the effectiveness of treatment was 32% (approximately 1.5 to 1 incidence of morbid events control versus treated). This difference was not significant, whereas treatment was 75% effective in the 105 to 114 mm. Hg diastolic group. Thus, the Veterans Administration Study indicated that diastolic hypertension of 105 mm. Hg or above in the elderly should be treated, but the benefit of treatment below that level of diastolic blood pressure remained conjectural.

The sample of elderly, mildly hypertensive patients in the Veterans Administration trial was too small to provide conclusive results. Mild hypertension is defined as diastolic blood pressure of 90 to 104 mm. Hg inclusive. Even fewer data are available on the effect of treatment of isolated or "pure" systolic hypertension in the elderly. "Pure" systolic hypertension is herein defined as a systolic blood pressure greater than 159 mm. Hg and a diastolic pressure less than 90 mm. Hg.

The large scale Hypertension Detection and Follow-Up Program has published mortality data from all causes for the various age groups.¹⁰ In this study patients with hypertension either were followed in special hypertension clinics or were referred out, usually to their family physicians. The patients were followed for five years. Blood pressure was controlled at an average of 5 mm. Hg diastolic lower in the clinic care patients than in the referred care group. Mortality from all causes was 16.4% lower in the clinic care as compared to the referred care group in the approximately 3,300 patients who were in the age range of 60 to 69 years at time of entry. Most of these patients had mild hypertension.

The European Working Party on High Blood Pressure in the Elderly are carrying out a study still in progress after two years of follow-up.¹¹ A significant reduction of blood pressure has been obtained in the treatment group, averaging 25/10 mm. Hg, and the only side effects observed have been a moderate increase in serum creatinine and serum uric acid levels and impairment of glucose tolerance. The addition of triamterene to small doses of hydrochlorothiazide prevented hypokalemia. The morbidity and mortality data are not yet available, but that the study is still in progress indicates that a significant difference between treatment and control groups has not yet appeared.

The Hypertension-Stroke Cooperative Study¹² contained a high proportion of elderly stroke survivors because 75% of the patients were in the

range of 50 to 70 years, only 16% were below 50, and 9% were above 70 years of age. There was no significant reduction in the recurrence of stroke among treated patients or in other cardiovascular events except for congestive heart failure. Only with respect to the latter did the drug-treated group exhibit a significant reduction.

The value of antihypertensive drug treatment in the management of elderly patients with mild diastolic hypertension or isolated systolic hypertension is still undecided. The evidence available at the moment is conflicting, and more data are needed to resolve the question. The Veterans Administration study suggests that the indications for treatment in the elderly are not much different from the indications for treating younger patients, that is, moderate or severe hypertension definitely should be treated. The value of treatment in mild hypertension could not be established in that study. The Hypertension Detection and Follow-up Programs study supplies much stronger evidence for treatment, but the data with respect to age have not been completely reported, especially with regard to morbidity and with respect to cardiovascular deaths alone. In the absence of more definitive data with respect to mild hypertension in the aged, it would seem best to consider the risk of each patient individually as a guide to deciding on treatment. In brief, treatment should be individualized.

Some special characteristics of elderly hypertensive patients are of considerable importance to successful management. First, elderly patients, contrary to general belief, frequently have highly labile blood pressures. A possible cause of this characteristic is loss of elasticity of arterial walls, which interferes with the action of the stretch receptors in the aortic arch and carotid sinus. Pressor influences such as emotional excitement then cause elevations of blood pressure which are not "sensed" by the baroreceptors and, therefore, the hypertensive response persists because of the lack of adequate buffering.

This phenomenon can lead to considerable confusion when dealing with aged persons. A patient may be apprehensive on his visit to the physician's office or in discomfort or pain which induces a pressor response which is not damped out by the usual baroreceptor activity. The physician taking the blood pressure may be misled into thinking that the patient has severe hypertension. Therefore, elderly patients should be seen on several occasions, and physicians should make sure that patients are not unduly apprehensive before making plans for treatment.

A second peculiarity of elderly patients is their increased responsiveness to antihypertensive agents. They are much more likely to develop hypotensive

reactions, including postural hypotension, than younger patients. Again, this phenomenon may be due in part at least to inadequate baroreceptor responsiveness to blood pressure reduction. The deficiency seems to involve both ends of the scale, inadequate buffering of hypertensive overshoots and inability to moderate hypotensive reactions.

Because of the poor buffering of drug-induced falls in blood pressure, antihypertensive drug therapy for the aged should be initiated at quite low doses. It is advisable, therefore, to begin treatment with half of the customary dose and then to increase slowly from that level, provided that the patient does not complain of such hypotensive symptoms as increased weakness, fatigue, faintness, and the like. Choice of drugs is similar for the elderly and the middle aged. Thiazide diuretics are indicated for initial treatment but at lower initial doses than normally. Beta-adrenergic agents can be used as second step drugs or as primary treatment if the patient has angina. Hydralazine in small doses, usually in combination with one of the above agents, also is well tolerated by the elderly, although it should be avoided in patients with angina. Drugs with alpha blocking components or centrally acting adrenergic blocking agents generally are not as well tolerated by the aged as by younger patients.

In summary, the indications for treatment of mild diastolic hypertension and of isolated systolic hypertension in the elderly are still unclear because of lack of sufficient well controlled clinical trials in this population. The indications for treating elderly patients with moderate and severe hypertension are the same as for younger patients, that is, a diastolic blood pressure averaging 105 mm. Hg after three or more office or clinic visits is an indication for treatment. At present, for patients in the range of 90 to 104 mm. Hg diastolic blood pressure, it would seem best to individualize each case and to treat or not according to such other risk factors as target organ disease, history of cardiovascular complications in the past, obesity, diabetes mellitus, and hypercholesterolemia.

Elderly patients may have unusually labile blood pressures, and it is wise to see patients over a series of visits before deciding on treatment. Elderly patients also are often very responsive to antihypertensive agents and are prone to develop hypotensive symptoms. Dosages of antihypertensive agents, therefore, should be initiated at half dose strengths and increased only if needed, paying particular attention to any hypotensive symptoms the patient might complain of.

REFERENCES

1. National Health Survey. *Hypertension and Hypertensive Heart Disease in Adults, 1960-1962*. U.S. Department of Health, Education and Welfare. Vital and Health Statistics Series II, No. 13. Washington, D.C., Govt. Print. Off., 1966.
2. Lawrence, S. V.: Old patients—New challenges. *Bull. Am. College Phys.* 19:9-13, 1978.
3. Kannel, W. B., Gordon, T., and Schwartz, M. J.: Systolic versus diastolic blood pressure and risk of coronary heart disease: The Framingham Study. *Am. J. Cardiol.* 27:335-46, 1971.
4. Fry, J.: Natural history of hypertension. A case for selective non-treatment. *Lancet* 2:431-33, 1974.
5. Jackson, G., Pierscianouski, T. A., Mahon, W., and Condon, J.: Inappropriate antihypertensive therapy in the elderly. *Lancet* 2:1317-18, 1976.
6. Schwid, S. A. and Gifford, R. W.: The use and abuse of antihypertensive drugs in the aged. *Geriatrics* 1:172-82, 1967.
7. Veterans Administration Cooperative Study Group on Antihypertensive Agents. Effects of treatment on morbidity in hypertension. Results in patients with diastolic blood pressures averaging 115 through 129 mm. Hg. *J.A.M.A.* 202:1028-32, 1967.
8. Ibid.: II, Results in patients with diastolic blood pressure averaging 90 through 114 mm. Hg. *J.A.M.A.* 213:1143-52, 1970.
9. Ibid.: III, Influence of age, diastolic pressure and prior cardiovascular diseases; Further analysis of side effects. *Circulation* 45:991-04, 1972.
10. Hypertension Detection and Follow-Up Program Cooperative Group: Five-year findings of the hypertension detection and follow-up program. I. Reduction in mortality of persons with high blood pressure including mild hypertension. *J.A.M.A.* 242:2562-71, 1979.
11. Amery, A., Bethaux, P., et al.: Antihypertensive therapy in patients above age 60. Third interim report of the European Working Party on High Blood Pressure in the Elderly (EWPHE). *Acta Cardiol. T.* 33:113-34, 1978.
12. Hypertension—Stroke Cooperative Study Group: Effect of antihypertensive treatment on stroke recurrence. *J.A.M.A.* 229:409-18, 1974.